501 /440 cont./
and the great efficiency of the bark boat, but have described the details only very superficially. Cooper: 197 simply listed the bibliography of the best descriptions.

[171] We should like to mention briefly that this bark canoe, ánan (or, more completely, ayyúsu ánan), is actually very similar in its design and principal parts to the one that the neighboring Halakwulup make (Fig. 25).

a. The Bark Pieces

•396 The vessel characteristic of the Yamana since ancient times is a canoe made out of three large pieces of bark. This is the one we shall describe in what follows. Most of our natives have in most recent times turned to the canoe made out of a single trunk
[177] and to the flat boat, but this happened only since Europeans brought them the iron ax.

396 The entire region is more or less densely supplied with Ant-
313 arctic beeches, but straight, thick trunks that furnish a smooth, even sheet of bark of sufficient length are found only singly and usually deep in the interior of an island. To discover these is probably the only reason a man is obliged to venture deep into the forest. Usually two or three men join together in the search, if for no other reason than because it is difficult for a single man to loosen the thick bark, ayyúsu, from the trunk and because no one goes alone for great distances in the woods (123). This traveling

123. As Hyades (q):350 says: "the chief concern of the Fuegians is to select the best bark; it is often necessary for them to take a long journey to find it" /translated from French/. Despard (b):679 adds: "a man, having associated three others, proceeds into the forest for four or five miles" /cited in English/.

hither and yon is frequently laborious and requires great effort. They almost always decide on Nothofagus betuloides, sér'i, which

/440 cont./

396 313 develops an even, smooth trunk and becomes thicker than the two other species of beech; moreover, its bark does not crack so easily (p. 28 /untranslated/) (124).

124. BD:661 emphasizes: "The bark especially of the hanis [Nothofagus pumilio] is consequently unfit for canoes" /cited in English/. Bridges (k):223 says: "The natives use the bark of the perennial beech [Nothofagus betuloides] for the construction of their canoes, since that of the other species is useless for this purpose" /translated from Spanish/.

When the men come across a trunk that can furnish a suitable piece of bark, they set to work. At least one of them is a capable canoe builder, and he estimates the proportions by eye. They distribute their forces to remove the bark, after they have carefully looked over the faultless piece, free of branches and scar protuberances. The smooth surface must measure at least five meters. The middle part of a long strap of seal skin, ûkgə̂a, [48] wusûkgə̂a, is tossed over one of the higher branches, so that the two halves hang down freely for the time being. There is a loop at one end, which one of the younger men puts around his hips and fastens. While his companion pulls the other end, the young man climbs up the trunk bracing himself with his feet and more or less embracing the trunk with his hands. At the top he begins the incision and /441/ draws it perpendicularly to the bottom. Since he is secured with a cord and slowly lowered by the other man, he has both hands free for this work. /Fig. 25 appears here./ Having arrived at the bottom, he must climb up again. Now he draws the horizontal incision all around the trunk. If the trunk is unusually thick and if one section of bark suffices, he must outline this in the required width by a second lengthwise cut. The second horizontal cut a little above the ground is easier to make.

396 313 412 For this work the man uses a bone wedge and a suitable flat stone as a hammer. The former, actually, is used only for the incision in the bark and, very seldom, also to split thicker trunks into firewood. It is made out of a wide rib bone of the whale and

[Text continues on page 113. -Analyst]

/441 cont./

396 313 412 is about 35 centimeters long. There is no actual handle. The piece of bone is filed on a rough stone until the wedge shape appears, with a slightly rounded blade (Fig. 26). The Indians grasp the upper half of this wedge, íla, with the left hand, place it against the bark with light pressure, and, with a stone in the right hand, hammer it in until they hit the fibers of the wood. They handle it like a chisel. If they do not have a wedge of bone, they make the incisions in the bark with a filed mussel shell or with the true shell knife (125), but this takes longer and is far more tiring.

125. Hyades (q):350 is speaking only of this when he maintains that the Fuegians "cut the bark on the tree by means of their mussel shells, sharpened and provided with a handle" /translated from French/.

396 313 After the piece of bark in the shape of a long rectangle has been outlined with the bone wedge, the man again ascends to the upper /442/ horizontal cut. Here he loosens the upper edge with the same or with a finer bone wedge, being careful not to split the bark. The more rounded the bark is, the more it tends to do this.

396 313 412 Some men use a peeler of bone known as /Figs. 26 and 27 appear here/ sífna, according to BD:383 "a bone bark stripper" /cited in English/. Lothrop (b):143 writes sínaka. It is about 60 centimeters long, quite flat, seven millimeters thick, and has the shape of a curved paper knife. It is made from a whale rib. It is pushed under the bark, little by little, about 15 centimeters deep, and with light leverage the bark is loosened all the way around, all the more safely since the peeler is slightly springy (Fig. 27) (126).

126. Spencer:131 says in this connection: "The Yahgans make incisions with shells or with stone knives, and prise off the slabs with a long, slightly curved and flat bone tool" /cited in English/. Despard (b):679 probably also refers to this piece which he describes as "a whale's bone made into the fashion of a curved knife" /cited in English/.

[Text continues on page 115.-Analyst]

/442 cont./

396 313 After the man has separated the bark from the trunk at the top and freed a space, he places first one and then the other foot into it. Now the weight of his body does the work. The more the sheet of bark is loosened, the farther he sinks down until finally he seems to be trapped between bark and trunk. He leans against the trunk and grasps the edges of the piece of bark with both hands, or he presses it away from his body with his hands flat. Stamping with his feet in this pinch, he finally peels it off entirely down to the bottom.

One can well imagine that this work is strenuous and uncomfortable, for the tough bark fibers cling fast and the strap does not give a firm hold. Sometimes the man makes it easier [481] for himself by tying short wooden pegs, tstĕskasĭna, one above the other, to the trunk at given intervals. These he uses like steps, but only until he can slip between the loosened bark and the stripped surface of the trunk where he can hold himself.

396 313 824 Everyone knows that the best time to strip the bark easily /443/ is during the spring weeks, from the middle of September to the end of October (127), during which time metabolism in

127. Lovisato (b):134 extends this period, namely, from October to February, but Bridges (MM:VIII, 156; 1874) only to January.

the bast zone is very active and the turgescence of the tissues is very high. Of course, it does not fail to happen that a family loses its boat at some other time of year and that a man must, of necessity, decide to make a new one. Without delay he must obtain bark pieces, no matter how great the effort. He knows that at any other time but spring the stripped bark is more brittle and splits more easily, hence is less useful.

313 396 As a precaution in the spring a man occasionally peels off pieces of bark which he does not need at the moment, but which he may later use for some urgent repair (128). This does not

128. "Not being able to build his boat except in the spring, the Fuegian foresightedly

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/443 cont./
sometimes makes two of them, but he always puts aside some pieces of bark with which to repair frequent damage" (La Nature: 275) /translated from French/. Lothrop (b):144 adds: "The extra piece was placed under water in a running stream to keep it flexible" /cited in English/.

help him, however, if he loses his vessel at some distant point and if there is no one nearby who will convey him to those pieces of bark. At the least everyone makes a mental note of the trees from which suitable sheets of bark can be removed; then when there is an emergency, he need not waste time looking. Sometimes there is nothing to be done but to wait until the next spring and only then start building anew.

Every piece of bark of the required size is protected from drying up and becoming distorted by being kept under water. It is laid in a pool with a marshy bottom, the buoyancy of which prevents warping. Moderately large stones are placed upon it to keep it from protruding above the surface of the water and expanding unevenly.

β. Its Construction

396 Every Indian knows that the dried sections of the sheet of bark can no longer be made flexible. That is why he generally removes the bark just before he needs it, or he scrupulously keeps it under water until he begins the work. Even when he is working on it and an interruption of several days is forced upon him because of very bad weather or a shortage of food, he at times must place the sheet of bark under water. The sooner he completes his work, the firmer the bark remains.

Three large pieces of bark are necessary (129) for the

129. There are two additional small triangular pieces for the tips on bow and stern. Altogether there are five pieces, never seven as Krickeberg:319 maintains.

/443 cont./

39% construction of the canoe, two wide pieces for the sides and a long, narrower, thick piece as the center section. /444/ The man drags them out of the woods and lays them on an open and even, grassy surface where he wants to do his work. The loose bark fibers on the inside are scraped off with a scraper or knife, or even with nothing but a sharpened mussel shell. Then the piece is turned around, and the outside smoothed by planing off the surface. When that has been done, the bark pieces, one after the other, are made flexible by being heated.

The sheet of bark is laid on a long fire with even charcoal heat. It is constantly turned and shifted so that all parts on both sides are evenly heated, but also protected from burning. This makes the entire sheet flexible, like thick leather, and in this state it can be bent into the desired shape.

They then make a choice by eye among the three pieces. As we have said, the side parts, *ŕuŕa* (*ruja*), must be wide, the center part, *ukúa*, which is to become the bottom of the boat, long and thick. Again measuring with his eye, the man begins [344] by cutting each piece properly. He never uses a rule or any kind of similar tool, such as a string, a little stick, or the span of his own hand. The center piece is made in the shape of a cigar, that is, the right and left third of its total length tapers and the ends are approximately ten centimeters wide, or at least one end, in case the other tapers to a point. The latter is used for the bow, the former for the stern. The other two sheets of bark are cut in such a way that one edge is almost straight, the other curved; both ends of each piece terminate slantwise in narrow points. After the center piece has been cut, the side pieces are made to tally exactly by means of repeated fittings. They must be as flexible as possible, which is why they are again and again drawn through fresh water and afterwards through fire.

Two uniform thin poles are now needed for the upper edge or gunwale. In accordance with the proportions and the contour of the planned construction, about a dozen short sticks are pounded into the ground on either side. These are necessary as a scaffold and support for the parts not yet joined. As soon as the three pieces of bark have been accurately trimmed so that they fit together, they are placed in this framework. Sometimes the men also dig

/444 cont./

out the earth in the shape of the planned canoe. Then each of the two poles, [illegible], one after the other, is sewn to the straight edge of the side sheet of bark, as the board. Their front ends later form the extreme point of the bow which rarely extends two to three centimeters above the bark.

For the sewing, one needs strips about one millimeter thick and three millimeters wide from the most recent layer under the bark of young trunks of Nothofagus antarctica. They are extremely flexible and so tough that they neither peel off in strands nor break, even when they are dried out. If a person can get the more suitable strips of whalebone, he chooses them, but otherwise he must /[illegible]/ resort to using the former which he carefully prepares (130). Near the upper edge of the sheet of bark he bores

130. Hyades (2):311 describes how they are prepared: "One divides the fibers of whalebone or of the layer under the bark into strips of equal length and thickness, polished on the edges by being scraped with broken shells" /translated from French/. They are kept under water so as not to dry out or warp premturely.

a small hole with a pointed bone awl and sticks the strip of wood fiber, [illegible], through it, draws it over the little pole, pulls it tight and continues in spirals about 13 centimeters apart until its entire length is fastened to the edge of the bark. The latter is safely protected by each of the two poles.

Below the long center piece of bark is fastened to the lower edges of the two side sections, approximately eight crossbars are fastened to the top. For these wedges, one chooses branches as thick as a thumb from the [illegible] (Maytenus magellanica), whose wood is very tough and hard. He scrapes off the bark and at either end carves a stub-like button. Around the somewhat thinner neck just in front of this button he winds the [illegible] thread, and with this he ties each end of the crossbar to the upper edge of the sheet of bark. The deep tapering of the crossbars just short of their ends serves as a collar for the [illegible] strip, preventing it from slipping in either direction. The center crossbar is, of course, the

/445 cont./

widest, and the others gradually become shorter toward the bow and stern. They hold the two walls of the canoe apart and in place. The shape of the two upper edges of the canoe is now fixed.

Up to this point the two side sections are held by the sticks hammered into the ground. They remain there when next the bottom, the narrower third sheet of bark, is put into place. At times the body of the boat is turned upside down or on its side for greater convenience in working. In order to make the center piece fit very snugly against the side sections, a step-shaped notching is carved along the entire length of its two side edges and fitted into a small protruding border on the curved edge of each side section. This very exact carving is done with sharp splinters of mussel shells and is easy to do on the thick bottom section. This section is then sewed to the two side pieces with the whalebone or the kut strip. Before these side pieces are pulled taut, the seams are stuffed, section by section, with moss, bundles of hay, and fine red algae to make them as watertight as possible (131) and also to prevent the woody thread from break-

131. Moreover, as Hyades (q):361 writes: "they are caulked with stalks of wild celery or other plants" /translated from French/. Bridges amplifies this, saying: "The seams are caulked with soaked and bleached stalks of wild celery, to which clay is sometimes added" (MM:III, 38: 1869) /cited in English/.

ing (132). The wife helps with the calking or she does it alone:

132. Despard (b):679 calls attention to this: "A rope of hay placed on the seam inside prevents the thread from cutting through" /cited in English/.

she is more skillful at it than the man.

/446/ The body of the canoe is now finished. After that the two triangular end pieces, known as ikuninix, also tumagal apej,

/446 cont./

396 are put into place on bow and stern. Sometimes only the one on the bow is deemed sufficient, if the excellence of the large bark pieces permits the one on the stern to be omitted. I was told that the construction of the canoe is sounder if the three large pieces of bark do not all taper to fine points at either end, but are cut off straight. The short triangular end pieces that are sewed to the cut surface prevent any tearing or splitting of the keel strip because they fit loosely. These two lāncinix are also sewed on with [283 824] úmi threads. Moreover, a thread made of braided mápi Marsippospermum grandiflorum) is wound tight around the extreme tip, its free end knotted on the last or the next-to-the-last small crossbar. *This prevents the fine tip from twisting outward which* it tends to do because it frequently gets damp and then dries again.

The middle third of the edges on both sides of the canoe is most subject to damage, for this is where one climbs in and out and also where most of the things are loaded. Hence, for greater safety, they make a separate gunwale of pieces of bark from a [824] trunk of Maytenus magellanica as thick as an arm. They peel off the bark and split it into equal halves; these are immediately placed on the edges of the canoe, each between two crossbars. Each half bends to form a half cylinder and is automatically clamped into place; it needs no other fastening. This bark facing, tétaka, has another advantage. It extends along the section in which the woman sits to row and thus protects her arms from injury. In rowing and steering she often rests them on the gunwale.

The outer construction of the canoe is now finished. It needs only a few additions to give it support and firmness. For this purpose, slender wooden ribs as thick as a finger are used, [834] namely, branches of Drimys winteri or of a Nothofagus, split down the middle. Both ends are cut to a short point, and the individual ribs bent into a half circle. They are arranged according to their length and pressed into the belly of the canoe so that they lie tight against the entire inner wall and are clamped under the gunwale on either side. These wooden ribs, tstekila, are close to each other; about 50 are used altogether. Before they are finally clamped into place, the small spaces and holes between them and the lower half of the canoe wall are stuffed with moss, algae, and grasses, for the thin-walled construction requires a great deal of calking. The vegetable matter used for this purpose is known

/446 cont./

396 by the collective term, hûsun. Short beech twigs are pushed under the bent-up ends of the ribs, which, as real packing, give them more support and a firm rest. One wants to make the most of the tension, for it, too, strengthens and protects the entire bark wall.

/447/ The central section of the canoe bottom gets the greatest load. Since there is danger of its breaking through, it is strengthened with a few flattened strips of bark placed loosely over the ribs without any fastening. They are arranged in two rows and are easily shoved apart sideways so that in the deepest section, in the center of the canoe, the water that has filtered in can be scooped out from time to time. These pieces of bark, ílax, are placed with the bark side against the canoe bottom; they fit against it very well. The weight of the passengers is thus distributed over a broad, springy base.

The canoe, however, is not yet satisfactory, because the strips of bark that have just been put into place are neither sufficiently comfortable for a person to sit upon, nor do they offer a secure footing. Hence a special lining, so to speak, is added in the middle of the canoe by placing several longer strips of bark a hand's breadth wide on top of the ílax. The bark side, which has been smoothed, is placed upward; this helps to keep the entire strip flat. The two narrow edges are first cut straight across, and then these lûka, bent into a semicircle, are pressed under the gunwale on each side. They were carefully measured beforehand, hence they rest tightly on the ribs for their entire length. They cover the shorter ílax on the floor of the canoe. One lûka strip is placed very carefully beside the other; between the two middle pieces a small slit is left free for bailing out the water that leaks. These lûka and the ribs described above were given the required semicircular shape by repeated elastic bending after they were saturated with water and heated in the fire, Their four edges must be cut very exactly, so that one strip of bark is joined very closely to the next, for only in this way do they serve their purpose (133), namely, to provide the occupants with a place to

133. The length of these bark pieces is determined by the size of the canoe. Hyades (q): 353 overlooked this fact.

396 /447 cont./
sit that is as dry as possible (134).

134. The word given above, according to BD: 283, means "those pieces of bark placed in canoes where the people sit to strengthen the canoe and to guard it from injury, as well as to give comfort to the occupants" /cited in English/.

The canoe is now finished. It takes an industrious man two to three weeks, if he can continue his work undisturbed and if he finds the necessary parts nearby. He always works in the shade, for the rays of the sun would heat the pieces of bark and distort them. The proportions of this vessel depend on the number of 501 members in the family, but the length never exceeds five meters in a straight line between the two extremities. The widest part from one gunwale to the other is under one meter; the depth in the center fluctuates around 70 centimeters (135). /448/ If we

135. Bove (e):157 and Colini: 162 write: "The length varies between four meters and six meters, the width between 70 centimeters and 90 centimeters."

compare the canoe of the Yamana, ánan, with that of the Halakwulup, we surely cannot overlook the differences in dimensions; the former is noticeably shorter and narrower, even somewhat flatter than the latter (136).

136. More or less detailed descriptions of the bark canoe can be found in Bridges (i):23, Bove (d):291 and (e):157, Cañas Pinochet: 356, Cojazzi: 108, Dabbene (b):180, Despard (b): 679, Fitz-Roy (a):140, Hyades (q):350, Lothrop (b):143, Martial:190, Spegazzini (a):161, Stirling in VSA:XI, 237, 1864, Webster: I, 184, Weddel (a):94, Wieghardt:30, and others. The individual parts used in it are listed in BD, and the kinds of handwork performed are named.

/448 cont./

396 The oars are regarded as part of the most essential equipment. The man makes them of beechwood for his wife. With a bone wedge (Fig. 26), he splits a trunk about 20 centimeters thick into a plank that he cuts and planes with sharpened pieces of mussel shells. In order to be able to grasp the shells better and 396 also to protect his hand against wood splinters, he uses a scrap 293 of leather which is like a mitten (Fig. 28). It is cut nearly trapezoidal in shape from the thick hide of a sea lion, and the two corners of one of the narrow ends are tied together with a little bundle of rushes. This makes a narrow opening through which one sticks the three last fingers of the right hand. The little piece of leather now covers the entire back of the hand and these three fingers, so that they are adequately protected.

/449/ Planing and smoothing the wood is an irksome task. 396 Particular difficulties are encountered at the place where the 501 shaft runs out from the blade because at that point the blade is usually left wide and has an edge. In most of the oars, all of which lack a special handle, one part gently and gradually leads over to the other; they are lancet-shaped, so to speak. The shaft is about a third of the entire length. It is noteworthy that the blade is never sharply differentiated from the shaft, but more or less gradually runs into it (138) and rounds off more narrowly

138. This very strikingly distinguishes it from the woman's oar of the Halakwulup, which has an absolutely rectangular blade, as I duly showed (Gusinde [o]: 547). The measurements for the oars of the Halakwulup are also larger as a whole. Pickering:19 had already observed: "The [Yamana-] Fuegians [are] making the blade [of the paddles] even narrower than do the North-western tribes" /cited in English/.

at the end. The center of the blade is always thicker than the edges and has a completely flat center rib. /Fig. 29 appears here./ Lothrop (b):147 says briefly: "The old-fashioned paddle had a long pointed blade and a short rounded handle. The blade

/449 cont./

396 501 was diamond-shape in section, so there was a tent-like ridge centrally down each side" /cited in English/. The length is never uniformly determined, but depends on the accidental length of the plank, varying by 150 centimeters. The blade measures about ten centimeters at its widest point. The husband adjusts the thickness of the well-rounded blade to suit his wife's wishes (Fig. 29).

501 [462] If necessity or danger during a trip should force a man to take an oar, he handles it in the same manner as the women. He does not, however, have his own oar, as Colini: 237 erroneously maintains.

Fig. 29. Oar Forms.

The most common designation for these oars, so-called paddles, is ɬppi; they are also called tstatɛ̄ga and tuswɛ̄na. Every family carries at least two oars in their vessel.

586 372 501 During the long trips our natives cannot possibly do without the fire. They keep it burning constantly in the canoe (p. 44). In the center of the bottom there is a specially prepared hearth, and adequate care is taken so that the bark underneath does not burn through. On the bottom they place a few flat stones close together so that there are no gaps. /450/ Upon this layer they place a rather large clump of turf which is at least seven centimeters thick, and its tangle of roots and coarse pebbles is turned upward. An alternative is to form a layer out of crushed mussel shells mixed with pebbles and lumps of clay. There is constant and ample moisture from the water that oozes in from below; hence this thick layer cannot become hot, and there is still less possibility that the bark floor can burn through. Since air has free access from all sides, the fire cannot flare up

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501 It takes boundless audacity to risk journeys to distant regions in an extremely fragile, completely unprotected vessel on treacherous waves. The vessel's construction shows its limited, brief durability. No matter how anxiously the wife tries to protect it, sooner or later and unavoidably the bark splits and cracks, if only because of the unequal heating of individual parts by the sun, and even more by many unavoidable blows, by the rough handling on the beach when it is brought to safety, and finally by the shifting load when the natives board and leave the canoe. True, the bark is flexible and it bends, but in doing so the firm cohesion of the finest fibers is loosened, which leads to visible breaks.

If a canoe is spared an actual accident and unusual damage, it serves a family who takes good care of it a whole year or somewhat longer. My Indian friends and my European informants assured me of this. Earlier reports mention lower figures. Hyades (g):38 and (q):304 writes: "In general one assumes that a good canoe will remain serviceable for not more than half a year (146), despite all the care that man and woman together

146. Bridges, too, says: The canoes "are very fragile, and it is necessary to make a new one every six months" (MM:III, 115; 1869) /cited in English/.

employ to preserve it." Despard (b):680 even says that "these canoes last only about three months" /cited in English/(147).

147. If this is true, his next sentence is most certainly correct: "So a man has to make a good many [canoes] in a few years, and must become pretty expert by the time he is 40" /cited in English/.

Dabbene (b):180, however, agrees with me that its "duration can be reckoned approximately at one year" /translated from Spanish/.

•396 The uncertainty in this matter among European judges may have arisen from the fact that in the fall, as well as in the spring,

/455 cont./

396 one man or another will build a canoe. If he has observed that the vessel he built only the previous spring will hardly last out the winter, he sets about early enough, that is, in the fall, to make a new one. He does not take great pains with it, since the bark is not as good in the fall and in any case he will commence a new and better one in the spring. This is the only explanation for Bridges' assertion (i):23 that "the canoes are made twice a year in the spring and autumn. The former are called hákua, the latter Een-ánan [better kísajánan] i.e. Winter Canoe. The natives are specially careful to make the latter well" /cited in English/. Spring is actually the time when the great majority of families make a new vessel (p. 115).

504 /456/ Through the years every man acquires some skill in this work, but this fact alone does not prevent him from treating his canoe most carefully and giving it his utmost attention. If he should lose it in the course of the year, he and his family would be in serious difficulty, sometimes in danger of starving. Heavy blows against rocks and tree trunks are particularly damaging because the bark sections break or tear. Rubbing against pebbles and sand soon causes the bottom and the threads of the seam to be scraped through. For this reason, the vessel is often kept in the open channel after the family has been brought to shore by the woman. Wherever the gently sloping beach permits, they make a sort of toboggan slide of damp Macrocystis algae over which they drag the canoe and upon which it rests. When boarding the canoe, everyone places his foot very carefully; in fact, everyone avoids any jolt and violent movement, for the seams easily burst and the seam threads become more brittle the older they are. In loading and unloading large objects are handled gently and cautiously.

422 462 Even though the man makes the canoe almost entirely by himself, it is not regarded as his property; the woman uses it and takes care of it. The man gives it to her, and it actually belongs to her or to the entire family. All the duties during the trip, as well as before and after, are her responsibility. She alone paddles. Squatting in the rear third of the vessel, close against the right side, she grasps the oar shaft with both hands, the left above the right, and pushes the oar diagonally backwards

462 502

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396 462 [422] Man and wife have their special share in the vessel; he builds it, and she keeps it in repair. Circumstances are such that every family owns only a single canoe, which is why it must be guarded all the more carefully (149). One canoe is never

149. Hyades (q):352 confirms that "the Fuegians take the greatest care of their canoes" /translated from French/. Others are of the same opinion.

exactly like another in all details, although they are all built according to the same pattern. Differences in size are determined by the available raw material, and some men are far more skillful than their neighbors. The term wáalina is used for a man who would find it difficult to build a canoe. [476] The men help each other in building it, and one man repays the other for his services with weapons or other valuable objects. No Yamana would hire himself out as a carpenter, but he does work for a close relative who is sick and helpless. From what has been said, we realize that the canoe is a vital and absolutely indispensable object for these Fuegians (150).

[439] 150. In the middle of 1868 Bridges, who was then a young man, brought two bark canoes to England. It was said that one of these was meant for a boy, the other for a girl. Actually these were models which, as such, had been ordered from an Indian. After that our Fuegians many times offered such small models for sale to Europeans. The two boat models mentioned above were described in detail in the "Illustrated London News" of August 18, 1868 (MM:III, 38; 1869). Many museums have good pieces of this kind.

501 /458 cont./
177 log" /cited in English/.

For about 20 years the dugout actually did rule supreme, while the bark canoe became more and more scarce. Since then a flat skiff has made its appearance, and today every family owns one of them.

396 /459/ There is not much to say about the construction and form of the dugout. A sound trunk was needed for it, which Nothofagus betuloides usually offered. It had to be quite smooth, straight, and tall enough so that when it was finished it corresponded in length to the medium-sized bark canoe. It was about a third narrower than the latter, whatever the thickness of the selected trunk. The tree was felled with blows of an ax, and the upper part, along with the crown, was cut off. Then the stump was trimmed. After the bark was peeled off, a short section of the curvature of the trunk was cut away, the two edges of which later became the gunwale. Then the hollowing-out process began and continued until the walls were reduced to a thickness of three to five centimeters. The natural curvature of the outer surface was retained, and only the bow was made blunt at the end. The work was extraordinarily facilitated if the cross-cut at the end was not retained. Instead, a small, U-shaped board was nailed on, which had to be carefully calked.

Sometimes the men made it easier for themselves by burning out the trunk, still upright, from below, but they guarded the fire well to make sure that the body of the prospective boat would not have holes in it. This procedure was advisable when the inner tissues of the trunk were largely rotten while the thick layer of wood fibers under the bark was still intact. One often finds such phenomena in the Antarctic beech forest.

The long open sides of the thin-walled body of the boat were widened at the top in the following manner. They spread a thick, protective layer of sand lengthwise and about 20 centimeters wide, and smeared the sides thickly with blubber. Then they placed glowing wood embers, evenly distributed, upon the entire layer of sand. The intense heat was transferred to the walls and made them somewhat expansible. This explains why every dugout looks as though it had been charred and burned. Suitable short thwarts squeezed in between the two side walls forced the latter apart and

/459 cont./

396 thus permanently widened the upper half. Once the tree trunk was hollowed out and closed off at the stern, no further additions were required and it could be put to use immediately. The natives [372] had to be content with a small fire which they kept going throughout the trip in a square tin can.

501 Compared with the bark canoe, however, which had served the Yamana for centuries as their sole means of transportation, 504 the modern dugout had many disadvantages. It capsized much more easily because it was not resilient and did not yield in any way, and because it was at least a quarter shallower than the bark canoe. Besides that, it could be moved on land only with great difficulty. True, the natives also made a sort of toboggan slide for it out of fresh algae, tuwētēka, over which it was hauled up and down. In spite of that, all the members of the family had to exert themselves to the utmost, otherwise they could not budge it. The wood of the /460/ Antarctic beech is heavy. Finally, the dugout could almost never be anchored in the open channel when the rocky coast did not permit its being hauled up. It was too heavy and too slippery to become entangled in a mass of floating Macrocystis. Ropes made of bundles of rushes (Fig. 31) are too weak to keep the boat tied up near the coast. If, in spite of this, it could be left out in the water, the natives could almost always expect it to overturn (154). Righting it again

154. Lothrop (b):146 says of the dugout which he took back to New York, "it was the most unstable vessel in which the writer has ever set foot" /cited in English/.

required great effort on the part of the woman, and bailing it out took considerable time.

501 In most recent times the natives have improved the dugout very much by elevating the gunwale slightly all the way around with a strip of wood nailed or sewed on. This afforded greater safety on the trip, but also added considerably to the weight of the whole thing.

Undeniably the dugout is more durable, but in contrast to this one advantage there are great drawbacks. Hence it is not surprising that after a few attempts the families of those days

/460 cont./

501 abandoned this new invention. Today we run across an occasional dugout used for short trips; a new one has not been made for three decades.

501 126 On my second trip I brought back to the museum in Santiago (Gusinde [b]:145) a dugout that had for years lain in the woods untouched near the mouth of the Rio Douglas. As Lothrop (b):146 says: "the last double-ended dugout afloat was purchased and is now in the Museum [of the American Indian in New York]. When purchased it had been in the water many years and was unbelievably heavy" /cited in English/. In short, anyone who owns a 501 dugout, like old Pedro, uses it as long as it is still serviceable; middle aged men have long since adopted the skiff. In a period of about 40 years the dugout came into use among the Yamana and disappeared again (155).

155. In this connection Spencer:88 says briefly: "Bark canoe precedes dug-out, which has now and for some years past entirely replaced bark" /cited in English/.

396 [439 177] 2. The Flat Skiff. Since the sawmills were started on Beagle Channel by Europeans, the natives can easily obtain good boards of different thicknesses. They are also given nails and iron strips. If they cannot buy their own tools, they borrow them everywhere. They do not lack the skill to make a low, short skiff. It must be wide because it is short and low. They curve the gunwale and produce a noticeably elevated bow with a sharp keel that slants backward. This makeshift (156) has /461/ no advan-

156. Lothrop (b):146 gives a short description and an illustration of it.

tages over a European construction, except for the tin can that is placed in the center for the fire. In the forward part they nail a narrow wooden crosspiece with a small hole in the middle. Into this is placed a short mast. If a light breeze comes up from the 502 rear, they hoist a piece of sacking, remnants of a woman's skirt,

2: Cooper E-4 (no date) 1946 SH6 Yahgan SH6

white, war and ritual; black, mourning. Designs were very simple, confined to lines, dots, and, less commonly, circles.

Red symbolized Peace;

Ornaments.—Personal adornments were: necklaces, of sections of bird leg bones strung on braided sinew, of strung punched shells (*Photinula violacea*), or of frapped hanks of braided sinew, often colored red; bone or shell pendants, sometimes attached to the necklaces; and wristlets and anklets of sinew and hide. Feather diadems and bird-skin, feather, or down-ornamented fillets or forehead caps were also used.

TRANSPORTATION

Canoes.—Travel by the *Yahgan* was almost entirely by water. Their earlier sole form of watercraft was the built-up bark canoe, of a crescent or gondola shape that characterizes other craft well up the west coast of South America to Perú; the plank boat, the *Araucanian* dugout, the seal-hide float, and the double-ended reed balsa were absent (Lothrop, 1932 a, pp. 253–54).

The *Yahgan* canoe (pls. 34, 35) was made of three strips of beech bark, one-half inch to more than an inch (1.2 to 2.5 cm.) thick, which ordinarily formed the bottom and two sides respectively. Average length was about 15 feet (5 m.), with a range from about 12 to 20 feet (4 to 7 m.); gunwale to gunwale width in center, about 3 feet (1 m.); depth in center, about 2 feet (0.6 m.). The bark, taken only from the evergreen beech (*Nothofagus betuloides*), was stripped off in the spring, when the sap was running. In removing the bark from the tree, the natives used a bone chisel or mussel-shell knife to cut it and a bone barking tool to strip it, and in ascending the tree held themselves thereto with a strong rawhide thong. After smoothing the bark on both sides with a small chisel, they cut it into three cigar-shaped pieces. These pieces were then sewn together with whalebone or with shreddings of warmed saplings, the seams being wadded with the stringy seams of wild celery grass or with moss mixed with mud. The gunwales were next lashed on. The ribs, of split Winter's bark, were then fitted in and locked in place under the gunwales. The thwarts, usually five or six, of hardwood, were inserted and lashed to the gunwale.

The fireplace was set amidships. The paddle was in one piece with a long lanceolate blade and short round-section handle without crosspiece or other grip. The *Yahgan* canoe leaked much; the cylindrical bailers (pl. 33, *e*) were usually of bark or sealskin. Sealskin thongs and braided grass ropes were used as mooring lines. The construction and repair of the canoe were the man's task; but its management, including paddling and mooring off shore in a kelp bed, were the woman's. In a sense, she was mistress of the canoe, with its hearth and ever-lighted fire. In a favorable wind a crude sail, made of a sealskin or

3: Lothrop E-5 (1924-1925) 1928
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principal purpose for which such stones were used was opening shellfish. These stones never were hafted.

6. SHARPENING STONES.—For sharpening knife and scraper blades the Yahgan employed a smooth stone (*chípi*) such as is shown in fig. 66, *b*. They can frequently be picked up on old camp-sites. The rounded hammerstones may also have been employed for sharpening.

FIG. 71.—Yahgan pumice polisher. Length, 2¼ in. (14/2224)

7. PUMICE.—For polishing, in place of our sandpaper or the Ona fox-skin and grit, the Yahgan used pumice (*hiól*). This material (fig. 71) is found on Picton island and on the coast of Tierra del Fuego to the north. It frequently floats down Beagle channel and may be picked up on the beach.

BOATS AND BOATING

BARK CANOE

In the old days the Yahgan used a curved bark canoe which in outline is well described by Goicueta's phrase, "like a moon of four days, with raised tips." The last one ever afloat is shown in fig. 72.

FIG. 72.—The last Yahgan bark canoe ever used. (Courtesy of Rev. John Williams.)

The bark employed (*afirshun*) was taken from the evergreen beech (*Nothofagus betuloides*), known to the Yahgan as *súschi*. It had to be stripped from the tree in the spring (October or November) when the sap was rising. For this purpose a tool made from the jaw-bone of a whale (*sánakaf*) was employed (fig. 67), and the

3: Lothrop E-5 (1924-1925) 1928
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• 396 men ascended the tree by means of a thong of seal-skin (*wurrsh*). An industrious and forehanded man often removed two pieces of bark at the right season of the year in case his canoe might be wrecked. The extra piece was placed under water in a running stream to keep it flexible and was held there by means of stones. The piece intended for immediate use was scraped with a shell scraper (*tu'wĕ'na*) until the fat inner bark (*ushkaq*) had been removed. The bark was then cut to pattern, three cigar-shape pieces usually serving for the skin of the canoe.

The bark was next tightly sewn together with pieces of whalebone, or, if none were obtainable, with saplings warmed before the fire and shredded when very hot. Split saplings were then set close together for ribs (*ushkúlakin*), and the ends of these were held in place by tapering gunwales (*wurri*) lashed to the bark sides (fig. 73).

[501]

FIG. 73.—Model of Yahgan canoe. Length, 40½ in. (14/4331)

Across from gunwale to gunwale, thwarts, usually six in number, were lashed in order to keep the sides from collapsing. Finally the slender bow and stern were joined to the nearest thwart by a seal-hide thong or a braided grass rope in order to give additional strength to the extremity of the vessel.

To complete the canoe a fireplace (*af*) was installed amidships, for even in these days of matches and European clothes no Yahgan goes to sea without his fire. The fireplace consisted of a heavy piece of sod with much earth attached. Over this was a layer of pebbles, and the whole was soon covered with ash. In the bow a rest for harpoons was installed.